

Phase 1 Draft Recirculated Substitute Environmental Document: Legal, Operational, Agricultural, and Public Health Concerns

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Stockton, California



Outline

- Legal and operational concerns
- Potential impacts to Delta economic sustainability
- Potential public health impacts from harmful algal blooms

Legal and Operational Concerns

- Justification absent for relaxing south Delta salinity objectives.
- Treatment of exports in Phase 1 is unstated.
- Compartmentalizing Phase 1 and 2 from California WaterFix operations.

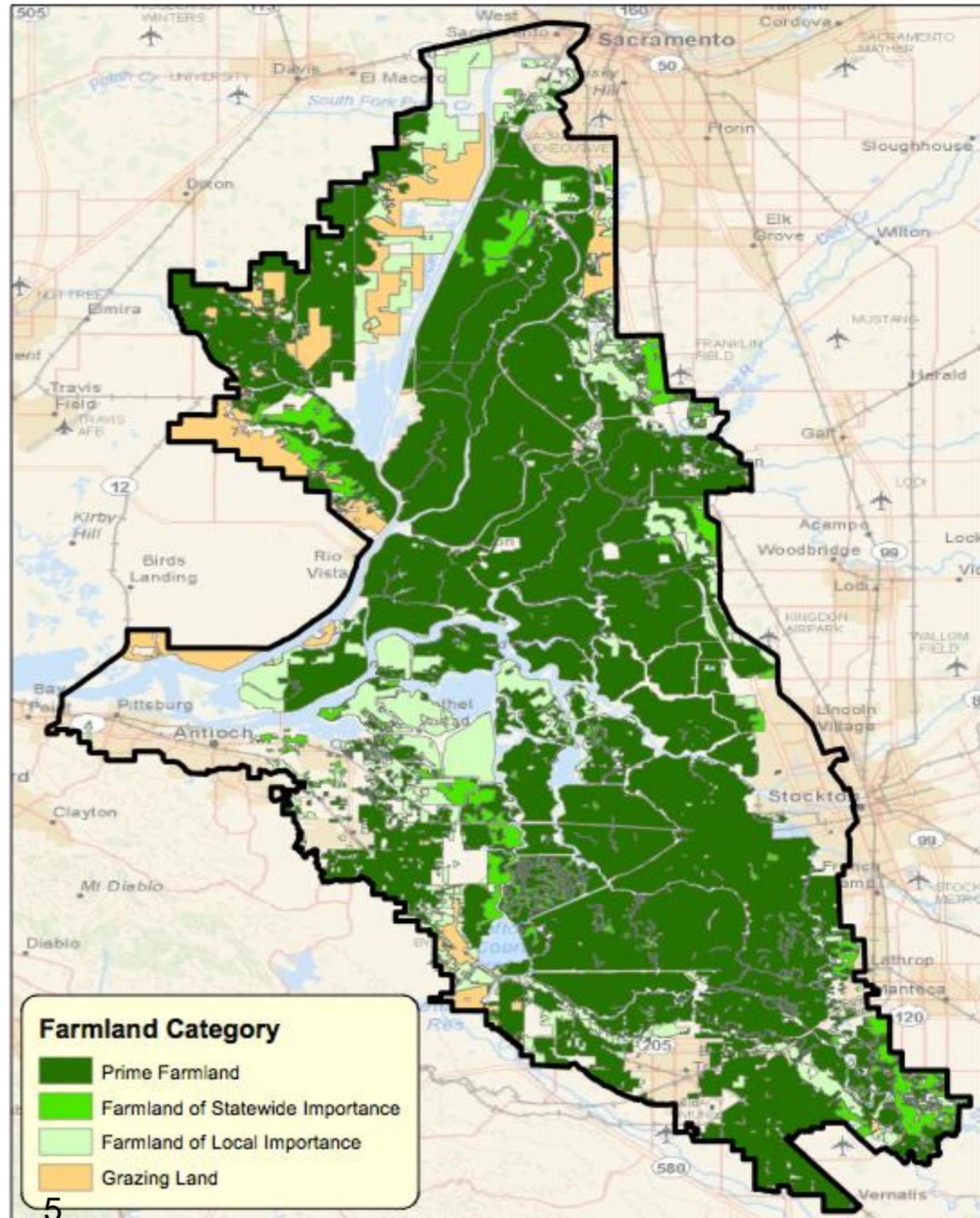
Legal and Operational Concerns

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Ag Economy

FMMP Delta Farmland Coverage

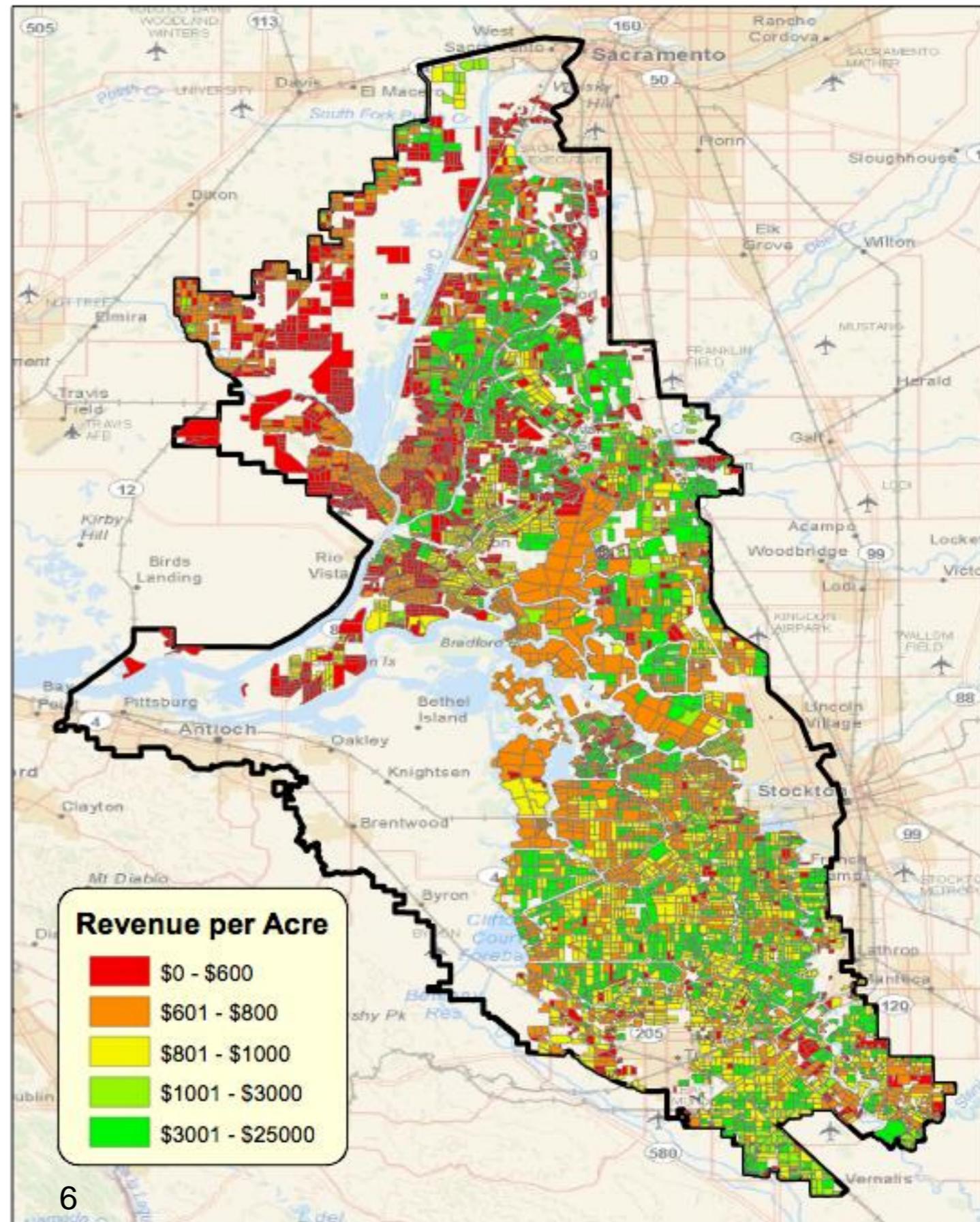
- 80% of Delta farmland categorized as prime farmland.
- Total 2010 423,727 cropped acres, not including 38,000 acres of grazing land.



Ag Economy

Delta Crop Value, 2009

- Highest revenue-per-acre crops: truck crops, deciduous crops.



Salinity Impacts

Forecasted Crop Revenue and Job Loss Impacts from Increasing Delta Salinity

Crop Category	Crop Category Average Revenue per Acre	Forecast Acreage					Total Revenue				
		Baseline	25% Salinity Increase	50% Salinity Increase	100% Salinity Increase	200% Salinity Increase	Baseline	25% Salinity Increase	50% Salinity Increase	100% Salinity Increase	200% Salinity Increase
[column]	[a]	[b]	[c]	[d]	[e]	[f]	[g]	[h]	[i]	[j]	[k]
Deciduous	\$4,612	6,954	5,971	5,051	3,486	1,499	\$32,071,848	\$27,538,252	\$23,295,212	\$16,077,432	\$6,913,388
			Percent Change from Baseline, Positive/(Negative)					(14.1%)	(27.4%)	(49.9%)	(78.4%)
Field	\$780	80,752	83,621	85,246	85,011	74,848	\$62,986,560	\$65,224,380	\$66,491,880	\$66,308,580	\$58,381,440
			Percent Change from Baseline, Positive/(Negative)					3.6%	5.6%	5.3%	(7.3%)
Grain	\$426	15,925	19,197	22,734	30,335	45,892	\$6,784,050	\$8,177,922	\$9,684,684	\$12,922,710	\$19,549,992
			Percent Change from Baseline, Positive/(Negative)					20.5%	42.8%	90.5%	188.2%
Pasture	\$116	2,963	3,757	4,667	6,810	12,056	\$343,708	\$435,812	\$541,372	\$789,960	\$1,398,496
			Percent Change from Baseline, Positive/(Negative)					26.8%	57.5%	129.8%	306.9%
Truck	\$3,903	29,804	24,460	19,843	12,741	5,029	\$116,325,012	\$95,467,380	\$77,447,229	\$49,728,123	\$19,628,187
			Percent Change from Baseline, Positive/(Negative)					(17.9%)	(33.4%)	(57.3%)	(83.1%)
Vineyard	\$3,566	3,519	2,911	2,376	1,534	594	\$12,548,754	\$10,380,626	\$8,472,816	\$5,470,244	\$2,118,204
			Percent Change from Baseline, Positive/(Negative)					(17.3%)	(32.5%)	(56.4%)	(83.1%)
Totals	\$1,651	139,917	139,917	139,917	139,917	139,918	\$231,059,932	\$207,224,372	\$185,933,193	\$151,297,049	\$107,989,707
Scenario Revenue Losses from Baseline								(\$23,835,560)	(\$45,126,739)	(\$79,762,883)	(\$123,070,225)

Source: October 10, 2011 Public Draft: Economic Sustainability Plan for the Sacramento-San Joaquin Delta, p. 131, Table 20; California WaterFix RDEIR/SDEIS, p. 4.3.10-1, lines 22-26; Restore the Delta. Page 1 of 2

Public Health

Harmful Algal Bloom (HAB) Growth Factors:

- Salinity
- Nutrient concentrations and ratios (principally nitrogen and phosphorus)
- Light access and water clarity
- Temperature
- Water stratification and residence time

Public Health

Potential harms from HABs:

- Skin rashes
- Digestive pain, diarrhea, and vomiting
- Fever, headache
- Kidney and liver problems
- Toxins can kill dogs

Contra Costa County Public Health,
2016.

Health Risks from Cyanotoxin Exposure

Range from a mild skin rash to serious illness or death.

Cyanotoxins	Acute Health Effects in Humans	Most common cyanobacteria producing toxin
Microcystin-LR	Abdominal pain, Headache, Sore throat, Vomiting and nausea, Dry cough, Diarrhea, Blistering around the mouth, and Pneumonia	<i>Microcystis</i> , <i>Anabaena</i> , <i>Nodularia</i> , <i>Planktothrix</i> , <i>Fischerella</i> , <i>Nostoc</i> , <i>Oscillatoria</i> , and <i>Gloeotrichia</i>
Cylindrospermopsin	Fever, Headache, Vomiting, Bloody diarrhea, Liver inflammation, and Kidney damage	<i>Cylindrospermopsis raciborskii</i> , <i>Aphanizomenon flos-aquae</i> , <i>Aphanizomenon gracile</i> , <i>Aphanizomenon ovalisporum</i> , <i>Umezakia natans</i> , <i>Anabaena bergii</i> , <i>Anabaena lapponica</i> , <i>Anabaena planctonica</i> , <i>Lyngbya wollei</i> , <i>Raphidiopsis curvata</i> , and <i>Raphidiopsis mediterranea</i>
Anatoxin-a group	Tingling, burning, numbness, drowsiness, incoherent speech, salivation, respiratory paralysis leading to death*	<i>Chrysochlorum (Aphanizomenon) ovalisporum</i> , <i>Cuspidothrix</i> , <i>Cylindrospermopsis</i> , <i>Cylindrospermum</i> , <i>Dolichospermum</i> , <i>Microcystis</i> , <i>Oscillatoria</i> , <i>Planktothrix</i> , <i>Phormidium</i> , <i>Anabaena flos-aquae</i> , <i>A. lemmermannii</i> , <i>Raphidiopsis mediterranea</i> (strain of <i>Cylindrospermopsis raciborskii</i>), <i>Tychonema</i> and <i>Woronichinia</i>

* Symptoms observed in animals.

8



September 16, 2016

CyanoHAB Trigger Levels for Human Health

	Caution Action Trigger	Warning TIER I	Danger TIER II
Primary Triggers^a			
Total Microcystins ^b	0.8 µg/L	6 µg/L	20 µg/L
Anatoxin-a	Detection ^c	20 µg/L	90 µg/L
Cylindrospermopsin	1 µg/L	4 µg/L	17 µg/L
Secondary Triggers			
Cell Density (<i>Toxin Producers</i>)	4,000 cells/mL	--	--
Site Specific Indicators of Cyanobacteria	Blooms, scums, mats, ect.	--	--

^a The primary triggers are met when ANY toxin exceeds criteria.

^b Microcystins refers to the sum of all measured microcystin variants. (See Box 3)

^c Must use an analytical method that detects ≤ 1µg/L Anatoxin-a.

9



September 16, 2016

CyanoHAB Postings

CAUTION

Harmful algae may be present in this water. For your family's safety:

- You can swim in this water, but stay away from algae and scum in the water.
- Keep children away from algae in the water or on the shore.
- For fish caught here, throw away guts and clean fillets with tap water or bottled water before cooking.
- Do not let pets and other animals go into or drink the water, or eat scum on the shore.
- Do not drink this water or use it for cooking.
- Do not eat shellfish from this water.

Call your doctor or veterinarian if you or your pet get sick after going in the water.
For information on harmful algae, go to mywaterquality.ca.gov/monitoring_council/cyanohab_network
For local information, contact: Enter your contact information in this text box.

WARNING

Toxins from algae in this water can harm people and kill animals

- No swimming.
- Stay away from scum, and cloudy or discolored water.
- Do not use this water for drinking or cooking. Boiling or filtering will not make the water safe.
- Do not let pets or other animals go into or drink the water, or go near the scum.
- Do not eat shellfish from this water.
- For fish caught here, throw away guts and clean fillets with tap water or bottled water before cooking.

For people, the toxins can cause:
- Skin rashes, eye irritation
- Diarrhea, vomiting

For animals, the toxins can cause:
- Diarrhea, vomiting
- Convulsions and death

Call your doctor or veterinarian if you or your pet get sick after going in the water.
For information on harmful algae, go to mywaterquality.ca.gov/monitoring_council/cyanohab_network
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DANGER

Toxins from algae in this water can harm people and kill animals

- Stay out of the water until further notice. Do not touch scum in the water or on shore.
- Do not let pets or other animals drink or go into the water or go near the scum.
- Do not eat fish or shellfish from this water.
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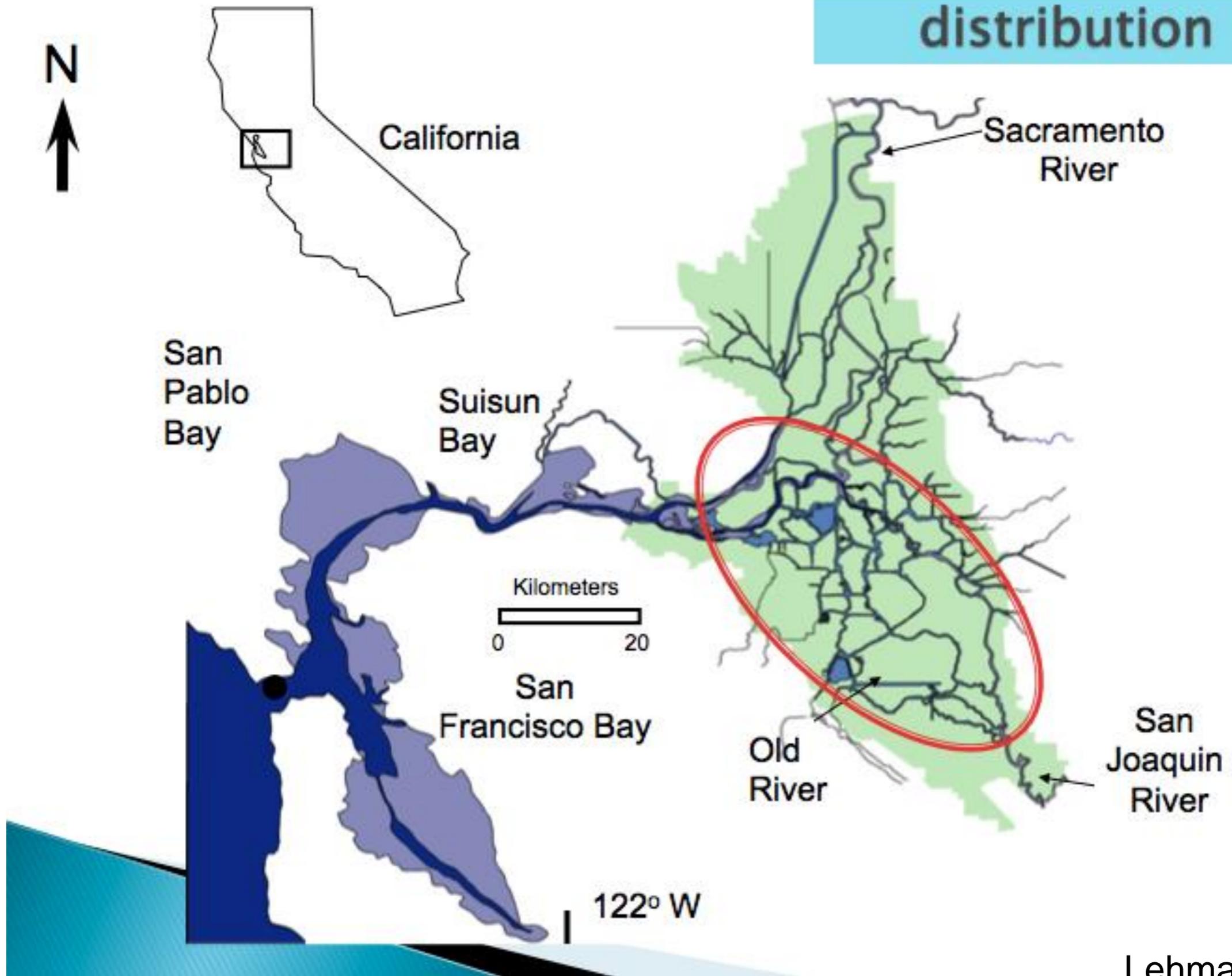
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Public Health

distribution



Lehman, 2016.